

REMARKS/ARGUMENTS

Claims 21-23 are active and drawn to the elected subject matter.

Claim 22 is amended to depend from Claim 21 thereby obviating the rejection under 35 USC 112, second paragraph.

No new matter is added.

The Examiner has withdrawn the previous rejections and has raised a new obviousness rejection combining the previously cited Finley and Honjo publications with newly cited U.S. 7,049,002 to Greenberg. A separate rejection against Claim 23 citing Finley, Hondo, Greenberg with the previously cited Krisko has also been raised.

Applicants respectfully disagree with the Examiner's findings and conclusion underlying the rejection as the skilled person would not have replaced the ZrO_2 layer of Finley with a SiO_2 layer, as Finley requires a specific ZrO_2 layer (orthorhombic or cubic). Further, it is known to the skilled person that SiO_2 is usually amorphous and is therefore very different in terms of structure from cubic or orthorhombic ZrO_2 .

In the last amendment, the Applicants amended the claims to define that the titanium dioxide photocatalytic layer is applied directly to the silicon dioxide layer as shown in the Examples. The titanium dioxide is applied in anatase form that after heating becomes crystalline (in whole or in part). The Examiner relies on Finley and Honjo for the same reasons as in the prior rejections citing these publications. While the Examiner agrees that neither Finley nor Honjo teach the direct deposition of titanium dioxide on silicon dioxide, the Examiner alleges that Greenberg fills in this deficiency (see the Official Action at page 4, last paragraph).

Greenberg suggests the inclusion of a sodium ion diffusion barrier (SIDB, see Fig. 1 and col. 9, line 22) layer between the substrate, e.g., glass (see col. 3, lines 13-15) and the photoactive layer, e.g., titanium dioxide with a thickness of, e.g., 0.5 to 1 μm (see col. 4, lines

24-27 and 59-67). The SIBD layer can be applied at a thickness of at least 100 or at least 500 Angstroms to prevent sodium ion migration from the substrate to the photoactive layer (see Fig. 2, col. 9, lines 56-66, col. 10, lines 1-4 and col. 10, lines 18-21). The range of thicknesses for the photocatalytic layer overlap with those described by Finley (see paragraph [0028]). Greenberg also teaches that post-coating annealing promotes crystalline phase formation (see col. , lines 59-64).

Honjo would have motivated one to modify Finley's temperature treatment to be the same as that claimed as has been discussed at length previously particularly in light of Finley's teachings the combined teachings of these references lead one away, rather than towards, the claimed invention which utilizes temperatures above 630°C as the skilled person would expect a lower anatase formation based on what Finley teaches.

Secondly, and even more telling as to the deficiencies of the rejections is the fact that Finley **requires** the presence of cubic or orthorhombic zirconium oxide phases to facilitate the anatase form of the titanium dioxide layer deposited on that zirconium oxide layer (see paragraph [0010] of Finley). Therefore, modifying Finley to replace the direct contact between the zirconium oxide and titanium oxide so that the titanium oxide directly contacts the silicon dioxide (as required in the present claims) would NOT have been done. Indeed, performing such a replacement is completely contrary to Finley's requirement and would render Finley's invention inoperable for its intended use. See MPEP 2143.01 sec. V and VI.

The Examiner may counter with an argument that Greenberg teaches the possibility of more than one layer as the SIBD layer 26 (see col. 9, lines 59-61) and the combinations of oxides, including zirconium oxides can be used (see col. 10, lines 1-6). However, even in that instance, the position of the titanium dioxide layer on the silicon dioxide layer with an intermediate layer of zirconium dioxide (as required by Finley) would still fail to meet the claimed requirement that the titanium dioxide is directly deposited on the silicon dioxide

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layer. The only way to achieve the claimed invention is to ignore the required zirconium-titanium oxide layers contact that Finley describes so as to insert a silicon dioxide layer in between those layers, which is not proper in light of Finley's teachings.

Withdrawal of the rejections is requested.

A Notice of Allowance is requested.

Respectfully submitted,

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